

WHAT IS CLAIMED IS:

1. A process of producing a resin molded product,  
comprising:

5           a step of forming a resist pattern on a substrate;  
          a step of forming a metal structure by depositing a  
metal in accordance with the resist pattern on the substrate;  
and

10           a step of forming a resin molded product by using the  
metal structure,

          wherein the step of forming a resist pattern comprises:

          a step of forming a plurality of resist layers on the  
substrate; and

15           a step of developing the plurality of resist layers  
through solubility control in such a way that an upper resist  
layer has lower solubility in a developer than a lower resist  
layer.

20           2. A process of producing a resin molded product  
according to Claim 1,

          wherein the solubility control comprises heat  
treatment control performed before the development step,  
for controlling amount of heat-treatment of the lower resist  
layer and the upper resist layer.

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3. A process of producing a resin molded product

according to Claim 2, wherein the step of forming a resist pattern comprises:

a step of performing heat-treatment of the lower resist layer before exposure of the lower resist layer; and

5 a step of performing heat-treatment of the upper resist layer before exposure of the upper resist layer.

4. A process of producing a resin molded product according to Claim 2, wherein the step of forming the resist pattern comprises:

a step of performing heat-treatment of the lower resist layer after exposure of the lower resist layer; and

a step of performing heat-treatment of the upper resist layer after exposure of the upper resist layer.

15 5. A process of producing a resin molded product according to Claim 1,

wherein the step of forming a resist pattern comprises, before the development step:

20 a step of exposing the lower resist layer; and

a step of exposing the upper resist layer, and

the solubility control comprises exposure control for controlling amount of exposure of the lower resist layer and the upper resist layer.

25 6. A process of producing a resin molded product

according to Claim 1, wherein the lower resist layer and the upper resist layer are made of resist of which solubility in a developer changes by exposure and heat treatment, and

the step of forming a resist pattern comprises, before the development step,

a step of exposing the lower resist layer;

a step of depositing the upper resist layer without performing heat treatment of the exposed lower resist layer; and

a step of performing heat treatment of the upper resist layer after exposing the upper resist layer.

7. A process of producing a resin molded product having an uneven surface used for material processing, comprising:

a step of forming a resist pattern on a substrate;

a step of forming a metal structure by depositing a metal in accordance with the resist pattern on the substrate; and

a step of forming a resin molded product by using the metal structure,

wherein the step of forming a resist pattern comprises:

a step of forming a plurality of resist layers; and

a step of developing a lower resist layer exposed with a mask pattern and an upper resist layer exposed with a mask pattern of the plurality of the resist layers, to form a

resist pattern having a raised or recessed portion with a plurality of different heights.

8. A process of producing a resin molded product according to Claim 1, wherein the step of forming a resist pattern comprises:

a step of depositing a plurality of resist layers;  
and

a step of exposing the plurality of resist layers at a time with an exposure mask or exposing each of the plurality of resist layers with an exposure mask of the same pattern, to form a pattern with a predetermined height.

9. A process of producing a resin molded product according to Claim 7, wherein the step of forming a resist pattern comprises:

a step of depositing a plurality of resist layers;  
and

a step of exposing the plurality of resist layers at a time with an exposure mask or exposing each of the plurality of resist layers with an exposure mask of the same pattern, to form a pattern with a predetermined height.

10. A process of producing a resin molded product according to Claim 1, wherein the step of forming a resist pattern further comprises a step of depositing and exposing

one or more resist layers after exposing the upper resist layer, to create a raised or recessed portion with two or more different heights.

5           11. A process of producing a resin molded product according to Claim 7, wherein the step of forming a resist pattern further comprises a step of depositing and exposing one or more resist layers after exposing the upper resist layer, to create a raised or recessed portion with two or  
10 more different heights.

          12. A process of producing a resin molded product according to Claim 7, wherein the step of forming a resist pattern forms a resist pattern having a raised or recessed  
15 portion with a plurality of different heights in one development step.

          13. A process of producing a resin molded product having a groove with a width of 2 to 500  $\mu\text{m}$  and an aspect  
20 ratio of 1 or more, and a through-hole, comprising:

          a step of forming a metal structure; and

          a step of forming a resin molded product,

          wherein the step of forming a metal structure comprises:

25           a step of forming a first structure having an uneven surface;

a step of forming a resist layer on the uneven surface of the first structure;

a step of forming a resist pattern by forming a raised or recessed portion of the resist pattern on a raised portion of the uneven surface of the first structure, or by forming a recessed or raised portion of the resist pattern on a recessed portion of the uneven surface of the first structure; and

a step of forming a second structure by depositing material for forming the second structure on the uneven surface of the first structure where the resist pattern is formed.

14. A process according to Claim 1, wherein a light source used for exposure in the step of forming a resist pattern is an ultraviolet lamp or a laser.

15. A process according to Claim 7, wherein a light source used for exposure in the step of forming a resist pattern is an ultraviolet lamp or a laser.

16. A process according to Claim 11, wherein a light source used for exposure in the step of forming a resist pattern is an ultraviolet lamp or a laser.

17. A process of producing a resin molded product

according to Claim 1, wherein a height of a raised or recessed portion of a resin molded product formed by the step of forming a resin molded product is substantially 5  $\mu\text{m}$  to 500  $\mu\text{m}$ .

5           18. A process of producing a resin molded product according to Claim 7, wherein a height of a raised or recessed portion of a resin molded product formed by the step of forming a resin molded product is substantially 5  $\mu\text{m}$  to 500  $\mu\text{m}$ .

10           19. A process of producing a resin molded product according to Claim 11, wherein a height of a raised or recessed portion of a resin molded product formed by the step of forming a resin molded product is substantially 5  $\mu\text{m}$  to 500  $\mu\text{m}$ .

15           20. A resin molded product produced by a process according to Claim 1, comprising at least one selected from a channel pattern, a mixing part pattern, a reservoir pattern, an electrode, a heater, and a temperature sensor.

20           21. A resin molded product produced by a process according to Claim 7, comprising at least one selected from a channel pattern, a mixing part pattern, a reservoir pattern, an electrode, a heater, and a temperature sensor.

25           22. A resin molded product produced by a process according to Claim 11, comprising at least one selected from

a channel pattern, a mixing part pattern, a reservoir pattern,  
an electrode, a heater, and a temperature sensor.

23. A chip used for clinical laboratory testing,  
5 produced by a process according to Claim 1.

24. A chip used for clinical laboratory testing,  
produced by a process according to Claim 7.

10 25. A chip used for clinical laboratory testing,  
produced by a process according to Claim 11.

26. A chip used for combinatorial chemistry, produced  
by a process according to Claim 1.

15 27. A chip used for combinatorial chemistry, produced  
by a process according to Claim 7.

28. A chip used for combinatorial chemistry, produced  
20 by a process according to Claim 11.

29. A chip for genetic applications, produced by a  
process according to Claim 1.

25 30. A chip for genetic applications, produced by a  
process according to Claim 7.



31. A chip for genetic applications, produced by a process according to Claim 11.

5           32. A channel member for a fuel cell, produced by a process according to Claim 1.

33. A channel member for a fuel cell, produced by a process according to Claim 7.

10           34. A channel member for a fuel cell, produced by a process according to Claim 11.

35. A process of producing a metal structure used for forming a resin molded product, comprising:

15           a step of forming a resist pattern on a substrate; and

            a step of forming a metal structure used for forming a resin molded product by depositing a metal in accordance with the resist pattern on the substrate;

20           wherein the step of forming a resist pattern comprises:

            a step of forming a plurality of resist layers; and

            a step of developing the plurality of resist layers on the substrate through solubility control in such a way that an upper resist layer has lower solubility in a developer than a lower resist layer.

36. A process of producing a metal structure used for forming a resin molded product, having an uneven surface used for material processing, comprising:

5           a step of forming a resist pattern on a substrate;  
and

          a step of forming a metal structure by depositing a metal in accordance with the resist pattern on the substrate;

          wherein the step of forming a resist pattern comprises:

10           a step of forming a plurality of resist layers; and

          a step of developing a lower resist layer exposed with a mask pattern and an upper resist layer exposed with a mask pattern of the plurality of the resist layers, to form a resist pattern having a raised or recessed portion with a plurality of different heights.

37. A process of producing a metal structure used for forming a resin molded product, having a groove with a width of 2  $\mu\text{m}$  to 500  $\mu\text{m}$  and an aspect ratio of 1 or more,  
20 and a through-hole connected to the groove, comprising:

          a step of forming a first structure having an uneven surface;

          a step of forming a resist layer on the uneven surface of the first structure;

25           a step of forming a resist pattern by forming a raised portion of the resist pattern on a raised portion of the

uneven surface of the first structure, or by forming a recessed portion of the resist pattern on a recessed portion of the uneven surface of the first structure; and

5        a step of forming a second structure by depositing material for the second structure on the uneven surface of the first structure where the resist pattern is formed.